

## CLAIMS

What is claimed is:

1. A method of constructing a lookup table of modes for encoding data for transmission in a wireless communication channel from a transmit unit to a receive unit, said method comprising:
  - a) selecting at least one quality parameter of said data as received by said receive unit;
  - b) determining a first-order statistical parameter of said at least one quality parameter;
  - c) determining a second-order statistical parameter of said at least one quality parameter; and
  - d) arranging said modes in said lookup table based on said first-order statistical parameter and based on said second-order statistical parameter.
2. The method of claim 1, wherein said first-order statistical parameter and said second-order statistical parameter are determined from a simulation of said wireless communication channel.
3. The method of claim 1, wherein said first-order statistical parameter and said second-order statistical parameter are determined from a field measurement of said wireless communication channel.
4. The method of claim 1 further comprising:
  - a) selecting a communication parameter;

- 3           b)    setting a target value of said communication  
4                parameter; and  
5           c)    arranging said modes in said lookup table based  
6                on said target value.

1           5.    The method of claim 4, wherein said communication  
2                parameter is selected from the group consisting  
3                of bit error rate, packet error rate, data  
4                capacity, signal quality, spectral efficiency and  
5                throughput.

1           6.    The method of claim 4, wherein said communication  
2                parameter is a statistical communication  
3                parameter.

1           7.    The method of claim 4, further comprising:  
2                a)    measuring a measured value of said  
3                communication parameter in said wireless  
4                communication channel;  
5                b)    assigning an adjustment to at least one of  
6                said first-order statistical parameter and  
7                said second-order statistical parameter  
8                based on a difference between said measured  
9                value and said target value.

1           8.    The method of claim 1, wherein said quality parameter  
2                is a short-term quality parameter.

1 9. The method of claim 8, wherein said second-order  
2 statistical parameter comprises a variance of  
3 said short-term quality parameter.  
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1 10. The method of claim 9, wherein said variance  
2 is selected from the group consisting of  
3 temporal variance and frequency variance.  
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1 11. The method of claim 8, wherein said short-term  
2 quality parameter is selected from the group  
3 consisting of signal-to-interference and noise  
4 ratio, signal-to-noise ratio and power level.  
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1 12. The method of claim 1, wherein said first-order  
2 statistical parameter comprises a mean of said at  
3 least one quality parameter.  
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1 13. The method of claim 1, wherein said second-order  
2 statistical parameter comprises a variance of said at  
3 least one quality parameter.  
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1 14. The method of claim 13, wherein said data is  
2 transmitted at more than one frequency and said  
3 variance is a frequency variance.  
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1 15. The method of claim 13, wherein said data is  
2 transmitted in a multi-carrier scheme and said  
3 variance is a frequency variance.  
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1 16. The method of claim 13, wherein said variance is  
2 a temporal variance.  
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1 17. The method of claim 1, wherein said transmitting step  
2 is performed in accordance with a transmission  
3 technique selected from the group consisting of OFDMA,  
4 FDMA, CDMA, TDMA.  
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1 18. A storage medium tangibly embodying a lookup table of modes  
2 for encoding data for transmission in a wireless  
3 communication channel from a transmit unit to a receive  
4 unit, said storage medium comprising instructions for:

- 5 a) selecting at least one quality parameter of said data  
6 as received by said receive unit;  
7 b) determining a first-order statistical parameter of  
8 said at least one quality parameter;  
9 c) determining a second-order statistical parameter of  
10 said at least one quality parameter; and  
11 d) arranging said modes in said lookup table based on  
12 said first-order statistical parameter and based on  
13 said second-order statistical parameter.  
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1 19. The storage medium of claim 18, further comprising  
2 instructions for:

- 3 a) selecting a communication parameter;  
4 b) setting a target value of said communication  
5 parameter; and  
6 c) arranging said modes in said lookup table based  
7 on said target value.

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20. The storage medium of claim 19, further comprising instructions for:

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a) measuring a measured value of said communication parameter in said wireless communication channel;

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b) assigning an adjustment to at least one of said first-order statistical parameter and said second-order statistical parameter based on a difference between said measured value and said target value.

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